REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

By way of this Amendment, new Claims 21 and 22 are presented for consideration. Thus, the claims currently pending in this application are Claims 1-22, with Claims 1, 21 and 22 being the only independent claims.

Before turning to the claims at issue here, a brief summary of the subject matter at issue in this application is provided. As the background portion of the present application points out, it is sometimes desirable when processing a preheated glass sheet to support the glass sheet on a gas cushion. Devices have been used in the past to create a gas cushion for this purpose, but the known devices typically utilize slot-shaped gas discharge channels. It has been found that these types of channels can form what is referred to as cooling edges which produce cooling shadows on the surface of the glass. Also, jet marks can occur in the flow impact zone of the gas jets emitted from the apertures, and this can lead to non-uniform cooling, and thus a non-uniform heat distribution. The result can be an undesirable non-uniform stress distribution in the glass sheet.

As recited in independent Claim 1, one aspect of the invention here involves a device for producing a gas cushion to support a preheated glass sheet. The device includes a chamber connected to a compressed gas source, wherein the chamber has an upper wall provided with a plurality of apertures in fluid communication with the source of compressed gas. The apertures form nozzles each having an entry bore as well as a progressively widening exit hole. The compressed gas from the source of compressed gas passes first through the entry bore of the nozzles and

then through the exit hole of the nozzles to create the gas cushion supporting the preheated glass sheet. In addition, the external surface of the upper wall of the chamber possesses a greater degree of perforation (sum of the exit areas of the exit holes in relation to the total area) in the edge zones of the external surface of the upper wall than in the central zone of the external surface of the upper wall completely surrounded by the edge zones. Advantages provided by this construction are discussed in the present application.

The Official Action sets forth a rejection of independent Claim 1 based on the disclosure in U.S. Patent No. 3,374,078 to Wright in view of the disclosure in U.S. Patent No. 5,079,931 to Lehto et al. That rejection is respectfully traversed for at least the following reasons.

Wright discloses a support bed 20 configured to support and convey glass sheets G. A portion of the support bed 20 is positioned in a furnace enclosure 22 so that glass sheets G are conveyed through the furnace enclosure 22. The furnace enclosure houses downwardly extending gas burners 25 as best seen in Figs. 1 and 2. These gas burners 25 radiate heat towards the glass sheets G supported on the support bed 20 and produce hot products of combustion as discussed in lines 45-49 of column 3 and lines 57-63 of column 6 of Wright. Although not specifically illustrated in Fig. 1 of Wright, the support bed 20 continues onward (i.e., towards the left) to convey the glass sheets G to a bending zone where the glass sheets G are gradually changed from a flat shape to a transversely curved shape and then to a tempering zone where the glass sheets g are subsequently cooled.

The Official Action correctly notes that the support bed 20 is not configured to possess a greater degree of perforation in edge zones of the external surface than in

the central zone of the external surface completely surrounded by the edge zones as recited in independent Claim 1. The Official Action thus relies on the disclosure in Lehto et al.

Lehto et al. discloses a press bending mould 6 and a ring-type mould 5 which together form a part of a glass bending section 4 for imparting complicated bending shapes to glass sheets. The press bending mould 6 includes two sets of orifices -- a first set of orifices 10 connected to a blasting-air distribution manifold 16 and a second set of orifices 11 connected to a suction-air collecting manifold 16.

As discussed beginning in line 14 of column 4 of Lehto et al., during operation, a glass sheet is supported on the ring-type mould 5 which possesses a shaping surface 15 matching the desired final bending shape of the glass sheet. The press bending mould 6 is also provided with a shaping surface 7, 8 that matches the final desired shape of the bent glass. The blasting-air distribution manifold 16 directs heated air to the orifices 10 of the press bending mould 6 as the shaping surface 7, 8 of the press bending mould 6 moves towards the glass sheet. The air from the orifices 10 heats the glass sheet and simultaneously builds a pressure effect between the shaping surface 7, 8 and the glass sheet.

The discussion beginning in line 38 of column 3 of Lehto et al. points out that a greater blasting air thermal effect is required in areas of the glass sheet subjected to the greatest deformation. Lehto et al. then goes on to explain ways of providing a greater blasting air thermal effect. Several disclosed ways of achieving this result with the disclosed press bending mould 6 is to provide a more dense pattern of orifices in those regions where more heat is required or to include orifices of varying sizes within different areas of the shaping surface.

The findings of fact established to date do not support the obviousness conclusion set forth in the Official Action. For example, Lehto et al. does not disclose that a gas cushion-producing device for supporting a preheated glass sheet should include an upper wall whose external surface possesses a greater degree of perforation in edge zones of the external surface than in a central zone of the external surface completely surrounded by the edge zones. Stated differently, Lehto et al. does not provide evidence that it would have been obvious to change the pattern or arrangement of orifices in the support bed 20 of Wright. Rather, what Lehto et al. discloses is simply that a press bending mould which blasts heated air at a glass surface to heat the glass sheet and which shapes the glass sheet by interacting with a ring-type mould can be provided with a more dense arrangement of orifices in those areas of the press bending mould which blast heated air at portions of the glass sheet requiring the greatest deformation.

In addition, relative to the language in Claim 1, the press bending mould 6 disclosed in Lehto et al. is not a chamber whose upper wall has nozzles connected to a compressed gas source for producing a gas cushion supporting a preheated glass sheet above the external surface of the upper wall of the chamber. Lehto et al. simply describes how to configure orifices in a press bending mould used to press and shape the glass sheet. To the extent the disclosure in Lehto et al. discloses anything of relevance to the Wright apparatus, it is simply that the bending station mentioned in lines 38-43 of column 3 of Wright can be configured in the manner described in Lehto et al.

It is thus respectfully submitted that the disclosure in Lehto et al. does not establish that it would have been obvious to utilize, in Wright's support bed 20, an

arrangement of holes as recited in Claim 1 of the present application. Further, the findings of fact fail to establish that it would have been obvious to utilize an arrangement of nozzles in the upper wall of a gas cushion-producing chamber to support a preheated glass sheet above the external surface of the upper wall of the chamber as recited in independent Claim 1. It is thus respectfully submitted that the obviousness rejection of independent Claim 1 and the associated dependent claims is not appropriate and should be withdrawn.

New independent Claim 21 is patentably distinguishable over the combined discloses in Wright and Lehto et al. for reasons similar to those discussed above with respect to Claim 1. In addition, Claim 21 specifies that the apertures in the upper wall of the chamber possess an entry bore and a widening exit hole so that the compressed gas from the source passes first through the entry bore of the nozzles and then through the exit hole of the nozzles to produce the gas supporting cushion that supports the glass sheet above the external surface of the upper wall of the chamber at a position between a ring mould and a vacuum mould. Quite clearly, Lehto et al. does not disclose an arrangement of apertures/nozzles in the upper wall of a chamber for producing a gas cushion that supports the glass sheet above the external surface of the upper wall of a chamber and at a position between a ring mould and a vacuum mould. Indeed, in Lehto et al., the orifices are actually formed in the vacuum mould 6 itself. Stated differently, Lehto et al. does not disclose that a cushion chamber, different from the press bending mould 6, should be provided with an arrangement of orifices as claimed for producing a gas cushion that supports a preheated glass sheet as recited in independent Claim 21.

New independent Claim 22 recites a method of processing a glass sheet that involves preheating a glass sheet, advancing the preheated glass sheet towards a bending station that includes a chamber possessing an upper wall provided with a plurality of apertures in fluid communication with a source of compressed gas, with the apertures forming nozzles each having an entry bore and a progressively widening exit hole, and with the external surface of the upper wall of the chamber possessing a greater degree of perforation in edge zones than in a central zone. The claim further recites that the method involves supporting the preheated glass sheet on a gas cushion in the bending station, wherein the gas cushion is produced by first passing the compressed gas from the source of compressed gas through the entry bore of the nozzles and then through the exit hole of the nozzles. The preheated glass sheet is supported on the gas cushion in the bending station so that the preheated glass sheet is supported above the external surface of the upper wall of the chamber at a position between a ring mould and a vacuum mould in the bending station. In addition, the preheated glass sheet is placed on the ring mould, and the vacuum mould is moved into engagement with the preheated glass sheet to bring the preheated glass sheet into a desired shape. This language in Claim 22 is based on, for example, the discussion beginning in the middle of page six of the application and extending onto page seven of the application.

This claimed method distinguishes over the combined disclosures in Wright and Lehto et al. because Lehto et al. does not disclose utilizing the disclosed configuration and arrangement of apertures/nozzles to create a gas cushion that supports a preheated glass sheet at a position between a press bending mould and a ring-type mould, with the preheated glass sheet then being brought into the desired

shape by placing the glass sheet on the ring mould and moving the vacuum mould into engagement with the preheated glass sheet. As explained previously, Lehto et al. merely discloses providing a certain arrangement of orifices on the press bending mould to create a greater blasting air thermal effect in areas of the glass sheet requiring greater deformation. Thus, at best, the findings of fact presented to date merely establish that it is known to provide a press bending mould with a more dense pattern of orifices in those regions where more heat is required or to include orifices of varying sizes within different areas of the shaping surface. Applying this finding of fact to the Wright disclosure would not have resulted in a method like that recited in Claim 22. It is respectfully submitted that the claimed method set forth in independent Claim 22 is also allowable.

The dependent claims define additional distinguishing aspects of the invention at issue here. These dependent claims are allowable at least by virtue of their dependence from allowable independent Claim 1 and so a detailed discussion of the additional distinguishing aspects of the device recited in each dependent claim is not set forth at this time. However, several dependent claims warrant mention.

For example, Claim 3 sets forth the ratio of the degree of perforation in the central zone to the degree of perforation in the edge zones, while Claim 4 defines the maximum degree of perforation of the external surface of the upper wall of the chamber. Also, Claim 5 recites that the external surface of the upper wall of the chamber possesses a greater degree of perforation in the edge zones of its longer sides than in the edge zones of its shorter sides, and Claim 6 states that the degree of perforation diminishes from the feed side for the glass side to the side of the surface opposite the feed side.

The Official Action addresses these claims by referring to the discussion near the bottom of column 4 of Wright. Here, Wright describes an arrangement of the exhaust outlets 36 in which exhaust outlets closer to the side edges have a smaller effective diameter than exhaust outlets towards the central portion of the support bed 20. This is not the same as the greater degree of perforation in the edge zones of the longer sides than in the edge zones of its shorter sides as recited in Claim 5 and in no way suggests the degree of perforation recited in Claim 4 or the ratio recited in Claim 3. This disclosure in Wright also says nothing about an arrangement of orifices from the feed side of the glass sheet to the side opposite the feed side as recited in Claim 6.

Of even more significance is the fact that the arrangement discussed at the bottom portion of column 4 of Wright specifically refers to the exhaust orifices 36. These exhaust orifices 36 serve as the mechanism for removing or exhausting gas which has passed through the inlet holes or orifices 34. Thus, the discussion near the bottom of column 4 of Wright has no relevance to an arrangement of nozzles which emit gas to produce a gas cushion supporting the glass sheet as recited in dependent Claims 3-6.

Early and favorable action concerning this application is respectfully requested.

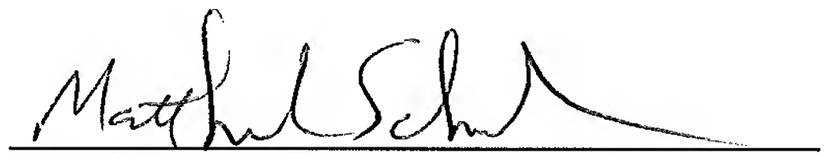
Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful

in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: July 16, 2010

By: 

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